Winemaking Techniques to Maximize Fruit Retention and Color Stability
Winemaking Good Practices to build a fruity balanced wine, to reach market segment goals with a conforming longevity,
1. Which are the successful wines?
Clean and sound
Conforming longevity
Without aggressivity

Conforming Wines
Wines that are Limit to conformity
Non Conforming Wines

Without aggressivity
Number 1 Axis: To build the right longevity
With a colloidal matrix sufficiently concentrated, balanced and stabilized

1. The right pH in the juice and the wine: a very powerful motor for the colloidal balances, the most powerful

2. Sufficient concentration with macromolecules from grape, yeast, bacteria, oak

3. Right concentration with compounds that participate to different families of aromas and their right interactions with macromolecules. Often, interactions are more important for sensorial expression than the molecular concentration itself
Right concentration with compounds that participate to different families of aromas and their right interactions with macromolecules

1. Sulfur like aromas and tastes
2. Chemical and solvent like aromas and tastes
3. Herbaceous and vegetal like aromas and tastes
4. Fruits and spices like aromas and tastes
5. Burning, cooked and / or pharmaceutical like aromas and taste
Some important considerations

- Fruity and spicy like aromas and taste, balanced acidity, roundness and length can express and last (longevity) only if:
  - The other 4 aromatic families are:
    - at enough low molecular concentration
    - in enough intense interaction with macromolecules
  - The compounds that may participate to fruit and spicy like aromas are in enough intense interaction with macromolecules
**Manage pH**

- Tartaric acid immediately in the fresh grape
- Note: the most efficient and eliminate the potassium that is in excess
- Don’t listen to trendy talks about malic and lactic...
Take interesting macromolecules

- Enough maturity of grapes cells (cell walls, aromas, pigments, tannins interacting with grape polysaccharides) and enough maceration
- Right yeast strain and right inactive yeast at the right moment, including after membrane treatments
- Right lactic bacteria strain
- Right oak, at the right dosage, at the right moments, starting with fresh grapes
Do not eliminate interesting macromolecules

- Be careful with excessive maceration or oak for too much time: they destabilize interesting macromolecule complexes
- Be very careful with excessive finings
- DO NOT USE copper sulfate or copper citrate = fruit killers!
- Work with membrane as soon as possible: to early balance the wine and be able to start again aging with the right inactivate yeast and the right oak
Other interesting axis (1)

- Eliminate potassium (and calcium) as soon as possible: pH membranes, resins or electrodialysis
- Absorption, as soon as possible, of compounds that participate to defects (sulfur, herbaceous, chemical, cooked-pharmaceutical): for example Noblesse with segmented fractionated additions, starting early during vinification and aging
Other interesting axis (2)

Avoid the 4 mistakes of micro-oxygenation:
1. Too much oxygen
2. Too much time
3. Too late during the life of wine
4. Too much contamination
Without aggressivity

Clean and sound

Conforming longevity

Conforming Wines

Wines that are Limit to conformity

Non Conforming Wines
2. Vinification Strategy
Winemaking goals and main risks management to reach the main market goals: A, B and C

- Taking fruit aromas from pulp and skin, pigments, polysaccharides from pulp and skin, hydrosoluble tannins from the skin
- Not extracting herbaceous aromas and aggressive tannins in the inner layers of the skin
- Extracting as few as possible ethanol soluble tannins.
Winemaking goals and main risks management to reach the main market goals : A, B and C (2)

- Avoiding sulfur like off odors: they amplify herbaceous and aggressive sensations on the nose and in mouth (metallic taste and bitterness).
  - The lowest efficient level of SO2 before fermentation
  - The right protection and nutrition of the yeast during fermentation
  - The right oxygenation program during maceration
  - The right program of racking, agitation during aging
A simple proof to demonstrate that yeast may have an impact on color stabilization

Vintage: 1997
Photo: 2004

From: ICV Internet site
www.icv.fr

ICV-D254
Levure de premier prix

Photo ICV

Low price yeast
Full bodied Pinot Noir with barrel aging
Temperature management with Cold Prefermentative Maceration

SO2: 2-3 g/hl. No more, we are going to talk soon about pH adjustment!
Yeast protection and nutrition strategy

- GoFerm Protect 40 g/hl
- OptiRed 30 g/hl
- Lalvin RC212 or ICV D21 or Cross Evolution at 30 g/hl
- Lactic Bacteria. VP41 One Step + Fermaid O 20 g/hl (if >14% vol.)
- Fermaid K 30 g/hl
- Noblesse 10 g/hl

On grapes: “hl” = 100 kg
On juice and wine: “hl” = 100 L

Reduless? 1 g/hl
Not more at this stage

1 week
OptiRed® in action on the colloidal matrix

Before

Anthocyanins exposed to instability reactions
OptiRed® in action on the colloidal matrix

During

OptiRed colloids
OptiRed® in action on the colloidal matrix

After

OptiRed colloids

Stabilized pigments
Délestage can be started as soon as the cap is formed. Délestage is also interesting during cold soak (with little air addition)
First tank is completely drained. An open jet in a bucket allows a true juice oxygenation: 2 to 4 mg/liter dissolved oxygen.

Some other systems can give a similar efficiency in adding dissolved oxygen.

Notes:
1= yeast and mud at the bottom of the tank
2= fermenting juice not in contact with the pomace
3= pigment and tannins concentrated juice below the pomace: low extraction, low stabilization
4= juice bathing the pomace
5= emerged pomace: no juice contact
Délestage. Step #1 (cont.)

Complete draining of the first tank is a key point of délestage. The most concentrated juice (the juice just below the cap) is renewed and oxygenated. A pumping over does not renew this juice. A punching down renews it, but does not oxygenate it.
Complete draining of the cap achieves the diffusion goals: extracts the most interesting grape macromolecules. Complete aeration brings stabilization, tannin «coating/enrobage» and sulfur off-flavor management.
The return of the juice is done with high flow and low pressure (flooding), to avoid mechanical action on the cap. It is not necessary to look for a complete cap bathing.
When the cap stays together, it percolates through the juice or the wine. In other situations, it «melts» in the juice giving also excellent juice / cap exchanges, without violent extractions.

Heavy lees that should be removed
**Strategy of maceration**

Destem, Crush, cool grapes + Adjust pH to 3.30 (don’t care about Total Acidity)

500-700 g/hl Chips, French, toasted Medium +

**Maceration enzymes**

Lallzyme EX-V

**1 week**

Delestage + lees elimination

Delestage + lees elimination

Delestage + lees elimin.

Del. + seeds elimination

Del. + seeds elimin.

Del. + seeds elim.

Drain

Rack
Strategy of oxygenation

Oxygen: 2-3 mg/L/day
Continuous

CO2

Oxygen: 3 x 2 mg/L
Oxygen: 3 x 3 mg/L
Oxygen: 3 x 3 mg/L
Oxygen: 3 x 3 mg/L
Oxygen: 3 x 2 mg/L

End of oxygenation

Drain
Rack
Agitation: a key action in red winemaking

Before agitation

During agitation

Notes:
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3= pigment and tannins concentrated juice below the pomace: low extraction, low stabilization
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5= emerged pomace: no juice contact
Strategy of agitation
Draining

Wine with lees
12-24 hours later: Heavy vegetal lees have sedimented

Wine with light lees

Heavy vegetal lees
12-24 hours later: Heavy vegetal lees have sedimented

Wine with light lees

Heavy vegetal lees
Racking. Step #1
Racking. Step #2
Strategy of temperature with Pinot Noir: with shorter maceration

SO2: 2-3 g/hl,

10-12°C

20°C

1 week

18°C

Rack

Rack

Drain
Aging
Strategy with agitations and rackings around malolactic

1 week

Agitation

TH2 + SO2

Noblesse 10 g/hl

2 rackings

Back to staves

200-400 g/hl

Staves Fr. M+

Second racking after draining

Rack to barrels

Noblesse 10 g/hl
## Doses of SO2 at the very end of malolactic

<table>
<thead>
<tr>
<th>pH</th>
<th>SO2 added</th>
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<tbody>
<tr>
<td>3,30</td>
<td>3 g/hl</td>
</tr>
<tr>
<td>3,40</td>
<td>4 g/hl</td>
</tr>
<tr>
<td>3,50</td>
<td>5 g/hl</td>
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Continue to work building the colloidal matrix and the longevity

**TH2?**
**SO2?**

**Noblesse**
- 10 g/hl
- 5 g/hl

**Batonnage**

**1 Month**

**Rack?**